

DCS: A CASE STUDY OF IDENTIFICATION OF KNOWLEDGE AND DISPOSITION GAPS USING PRINCIPLES OF CONTINUOUS RISK MANAGEMENT

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The Human Research Program (HRP) is formulated around the program architecture of Evidence-Risk-Gap-Task-Deliverable. Review of accumulated evidence forms the basis for identification of high priority risks to human health and performance in space exploration. Gaps in knowledge or disposition are identified for each risk, and a portfolio of research tasks is developed to fill them. Deliverables from the tasks inform the evidence base with the ultimate goal of defining the level of risk and reducing it to an acceptable level. A comprehensive framework for gap identification, focus, and metrics has been developed based on principles of continuous risk management and clinical care. Research towards knowledge gaps improves understanding of the likelihood, consequence or timeframe of the risk. Disposition gaps include development of standards or requirements for risk acceptance, development of countermeasures or technology to mitigate the risk, and yearly technology assessment related to watching developments related to the risk. Standard concepts from clinical care: prevention, diagnosis, treatment, monitoring, rehabilitation, and surveillance, can be used to focus gaps dealing with risk mitigation. The research plan for the new HRP Risk of Decompression Sickness (DCS) used the framework to identify one disposition gap related to establishment of a DCS standard for acceptable risk, two knowledge gaps related to DCS phenomenon and mission attributes, and three mitigation gaps focused on prediction, prevention, and new technology watch. These gaps were organized in this manner primarily based on target for closure and ease of organizing interim metrics so that gap status could be quantified. Additional considerations for the knowledge gaps were that one was highly design reference mission specific and the other gap was focused on DCS phenomenon.